

Docket No. F-8167

Ser. No. 10/791,388

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A solid laser apparatus having a semiconductor laser for emitting a laser beam, a microchip laser crystal arranged for being excited by the laser beam emitted from the semiconductor laser and provided with [[its]] crystal end faces coated for use as an optical resonator, a nonlinear optical device for receiving a laser beam from the microchip laser crystal and emitting [[its]] a harmonic light of the laser beam, an optical detecting means used as a monitor for detecting [[the]] an intensity of the harmonic light emitted from the nonlinear optical device, and an output control circuit for driving the semiconductor laser so as to maintain the intensity of the harmonic light at a predetermined level, wherein

the output control circuit includes a lowpass filter and a highpass filter arranged in series with one another.

2. (Currently Amended) A solid laser apparatus according to claim 1, wherein [[the]] a cutoff frequency of the highpass filter is arranged higher than [[the]] a cutoff frequency of the lowpass filter.

Docket No. F-8167

Ser. No. 10/791,388

3. (Canceled)

4. (Currently Amended) A solid laser apparatus having a semiconductor laser for emitting a laser beam, a nonlinear optical device for receiving a laser beam from the semiconductor laser and emitting ~~[[its]]~~ a harmonic light of the laser beam, an optical detecting means used as a monitor for detecting ~~[[the]]~~ an intensity of the harmonic light emitted from the nonlinear optical device, and an output control circuit for driving the semiconductor laser so as to maintain the intensity of the harmonic light at a predetermined level, wherein

the output control circuit includes a lowpass filter and a highpass filter arranged in series with one another.

5. (Currently Amended) A solid laser apparatus according to claim 4, wherein ~~[[the]]~~ a cutoff frequency of the highpass filter is arranged higher than ~~[[the]]~~ a cutoff frequency of the lowpass filter.

6-10. (Canceled)

11. (New) A laser apparatus comprising:

Docket No. F-8167

Ser. No. 10/791,388

a laser device for emitting a laser energy, said laser device including a controlling input for controlling a level of the laser energy;

a nonlinear optical device for receiving said laser energy of the laser device and emitting a signal in the form of a harmonic light produced from the laser energy, said nonlinear optical device introducing a -90 degree phase shift into the signal at a predetermined signal frequency;

an optical detector detecting the harmonic light and outputting a detector signal representative of an intensity level of the harmonic light

an output control circuit for driving the controlling input of said laser so as to maintain the intensity level of the harmonic light at a predetermined level, said output control circuit including a feedback circuit receiving said detector signal and having a phase characteristic introducing a positive phase shift at said predetermined signal frequency to produce a feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

12. (New) The laser apparatus according to claim 11 wherein said output control circuit includes:

said feedback circuit being a high speed feedback circuit and said feedback signal being a first feedback signal;

a low speed feedback circuit receiving said detector signal and producing a second feedback signal;

Docket No. F-8167

Ser. No. 10/791,388

said high speed feedback circuit and said low speed feedback circuit being arranged in parallel; and

a drive circuit receiving said first and second feedback signals and driving said controlling input using said first and second feedback signals.

13. (New) The laser apparatus according to claim 12 further comprising a microchip laser crystal arranged for being excited by said laser energy emitted from said laser and provided with crystal end faces coated for use as an optical resonator wherein said nonlinear optical device and said microchip laser crystal produce said -90 phase shift in combination with each other.

14. (New) The laser apparatus according to claim 13 wherein said high speed feedback circuit includes a lowpass filter and a highpass filter arranged in series with one another, to introduce said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

Docket No. F-8167

Ser. No. 10/791,388

15. (New) The laser apparatus according to claim 14, wherein a cutoff frequency of the highpass filter is arranged higher than a cutoff frequency of the lowpass filter.

16. (New) The laser apparatus according to claim 12 wherein said high speed feedback circuit includes a lowpass filter and a highpass filter arranged in series with one another to introduce said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

17. (New) The laser apparatus according to claim 16, wherein a cutoff frequency of the highpass filter is arranged higher than a cutoff frequency of the lowpass filter.

18. (New) The laser apparatus according to claim 11 wherein said feedback circuit includes a lowpass filter and a highpass filter arranged in series with one another to introduce said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

Docket No. F-8167

Scr. No. 10/791,388

19. (New) The laser apparatus according to claim 18, wherein a cutoff frequency of the highpass filter is arranged higher than a cutoff frequency of the lowpass filter.

20. (New) The laser apparatus according to claim 11 wherein said feedback circuit includes a bandpass filter having a center frequency higher than said predetermined frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

21. (New) The laser apparatus according to claim 12 wherein said high speed feedback circuit includes a bandpass filter having a center frequency higher than said predetermined frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

22. (New) The laser apparatus according to claim 13 wherein said high speed feedback circuit includes a bandpass filter having a center frequency higher

Docket No. F-8167

Ser. No. 10/791,388

than said predetermined frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

23. (New) The laser apparatus according to claim 11 wherein said feedback circuit includes a pseudo notch filter of which gain is arranged to have a local minimum at the predetermined signal frequency and not zero at a notch frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

24. (New) The laser apparatus according to claim 12 wherein said high speed feedback circuit includes a pseudo notch filter of which gain is arranged to have a local minimum at the predetermined signal frequency and not zero at a notch frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

Docket No. F-8167

Ser. No. 10/791,388

25. (New) The laser apparatus according to claim 11 wherein said feedback circuit includes a phase shift circuit for advancing the phase of said feedback signal in a vicinity of the predetermined signal frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.

26. (New) The laser apparatus according to claim 12 wherein said high speed feedback circuit includes a phase shift circuit for advancing the phase of said feedback signal in a vicinity of the predetermined signal frequency so as to provide said phase characteristic introducing said positive phase shift at said predetermined signal frequency to produce said feedback signal driving said controlling input such that noise attenuation is achieved by feedback control at said predetermined frequency.